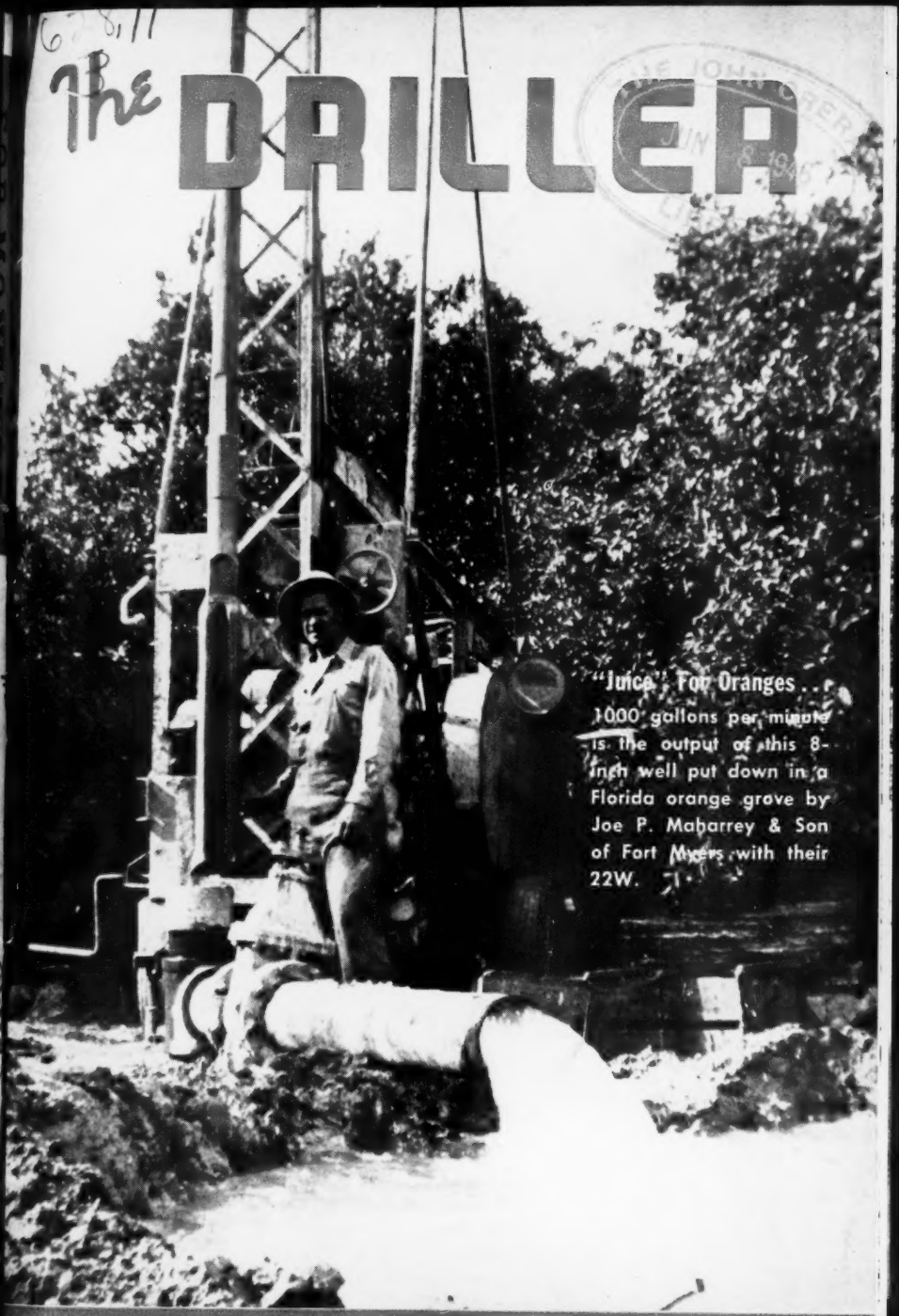
The DRILLER



"Juice" For Oranges . . . 1000 gallons per minute is the output of this 8-inch well put down in a Florida orange grove by Joe P. Mabarrey & Son of Fort Myers with their 22W.

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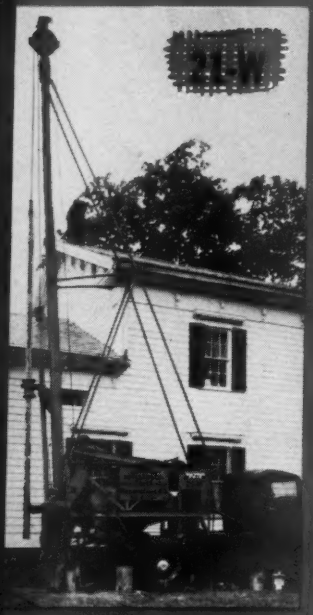
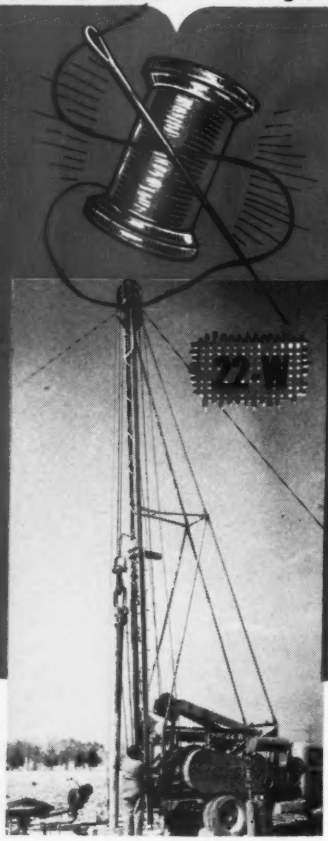
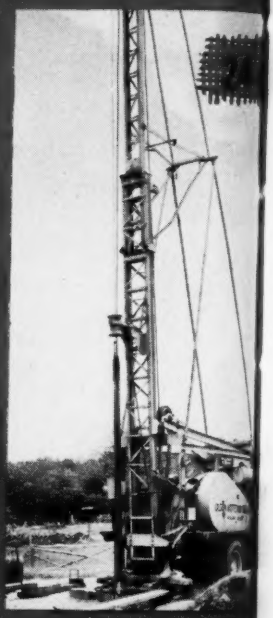
VOLUME 20 JUNE, 1946 NUMBER 6

Bucyrus-Eries are TAILORED to Your Needs

All profit-making Bucyrus-Eries conta these special features that add up to ex footage, extra time, and extra contra







STRENGTH:

All-steel, electric-welded frames rigidly hold the machine's precision-meshed gears in firm, lasting alignment — there are no bolts or rivets to break off or work loose.

CONTROLLED POWER:

Machinery is simple, yet scientifically constructed to furnish the most efficient use as power is transmitted to the drilling tools. The power is applied directly from the jack shaft to the spudding gear, which eliminates in-between gears that sap engine power, and does away with a proportionate amount of torque.

EFFECTIVE DRILLING ACTION:

Each Bucyrus-Erie has the patented rubber shock-absorber that gives drilling tools a sharp, shattering, hole-producing blow, and at the same time cushions the harmful, jarring vibrations that injure a machine.

SIMPLE OPERATION:

One man alone can operate a Bucyrus-Erie drill because all controls are conveniently placed within an arm's reach of the driller when standing by his drilling line. There is no cramping, twisting, or stretching to get at the various controls — all levers are in plain, easy view.

QUICK SET-UPS:

Quick set-ups are accomplished little effort. Raising or lowerin telescoping derrick is a matter few minutes with the gear driven winch. This feature makes B Eries leaders in field maneu

MOBILITY:

Each model drill can be moun suit your needs: trailer-mounted, mounted, or steel wheel-m Bucyrus-Erie can take care o personal transportation proble determined by local conditions.

For the well driller who wants that measures up to his sp tions, Bucyrus-Eries are TAIL for his needs.

BUCYRUS ERIE

WISCONS

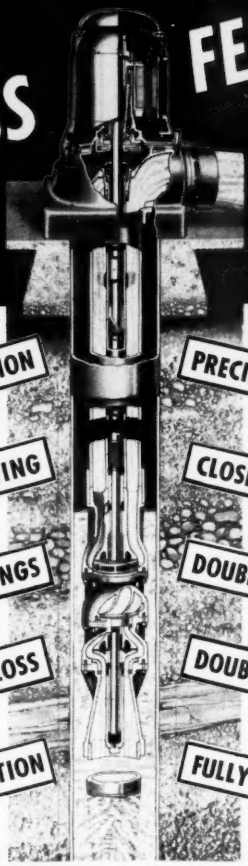
June,

10 PEERLESS FEATURES

AT NO EXTRA COST

ADD EXTRA LIFE

PEERLESS PUMPS



NO CORROSION

PRECISION SHAFTING

SMOOTH STARTING

CLOSER TOLERANCES

BRONZE BEARINGS

DOUBLE IMPELLER SEAL

LESS HYDRAULIC LOSS

DOUBLE BOWL BEARINGS

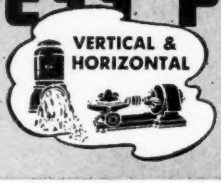
CONTINUOUS LUBRICATION

FULLY ENCLOSED IMPELLERS

Peerless OIL-LUBRICATED Vertical Turbine Pumps produce up to 30,000 g p.m., from wells 4" in diameter and larger. Also available with water lubrication.

PEERLESS PUMPS

PEERLESS PUMP DIVISION
Food Machinery Corp.



FACTORIES
LOS ANGELES 31, CALIFORNIA
301 West Avenue Twenty-six
QUINCY, ILL. ★ CANTON 6, OHIO

Water
Water
Water!

W. S. Williams Gets It

• This gushing 20-inch well of Williams' was brought in with dry ice and pumps 3,800 g.p.m.

A GUSHING TORRENT of water issuing from a 20-inch well at the rate of 3,800 gallons per minute is a feat for any driller to be proud of, but Walter S. Williams, veteran drillman from Phoenix, Arizona can remember back when he topped this, his latest "strike"!

The above mentioned well was drilled 634 ft. deep with both solid tools and mud scow and jacks in 19 eight-hour days. First Williams drilled 130 feet with solid tools weighing 3,400 pounds, then he strung on his 2,000-pound scow to go the rest of the way; it was necessary to dig an anchor pit for the jacks 5 x 14 x 11 feet deep in the process.

The well was drilled for the Boswell Company, and included in the 19 days' work was the perforation of 4,798 holes done with a Mill's Knife and completed by the Arizonan in eight hours flat — another creditable performance in itself.

Back in 1935 while drilling for the Roosevelt Irrigation District, Williams really hit the jackpot. He sank a 24-inch hole that produced a cascade of water at a rate of 8,360 g.p.m.; the well is the high point in the 26 years that Williams has been drilling in the arid, boulder-strewn terrain of Arizona. This tremendous gusher was put down 202 feet with difficulty through large boulders. When finished, the well had a 16-foot level and an 18-foot drawdown.

Other Williams records are equally notable. His deepest well was a 10-incher that went down 1,240 feet and his quickest job while drilling for an airfield in Southern Arizona was another 10-inch hole that he drilled 305 feet in just 48 hours.

At present, Williams is on another whopper of a job. At last reports he was down 790 feet in a 20-inch and was still going! He is using a 16-inch

Veteran Arizona Driller uses mud scow method to produce remarkable flowing wells during 26 years of drilling experience in the Southwest.

diameter mud scow 14-feet long with walls of the barrel ½-inch thick. The valve is belled out to an 18-inch diameter with a sharp edge and a clay bit welded to the bottom. The clay bit also has a sharp edge and the edges of the scow bottom and clay bit are both faced with hard metal.

Aided by one helper, the Phoenix Driller works a 200-mile radius around Phoenix with his Bucyrus-Erie 24-W mounted on a truck in what he calls, "In general, the hardest field in the U. S. A." The area is typical scow country, and he uses the heaviest scows attainable — the walls of the pipe being ½-inch thick in many instances — though boulders are encountered that must be broken up with solid tools.

Has Varied Experience

As far as various types of wells drilled are concerned, Williams has had experience with most of them including wells for farms, rural and suburban residences, industries, irrigation, air-conditioning, and soil test wells; however, 80% of his business has been water wells.

The well sizes ranged from 4-inch to 24-inch, though recently Williams has been drilling 20-inch holes with an average depth of 500 feet for the Goodyear Farms, owned by the Goodyear Tire and Rubber Company for irrigation of the long staple cotton grown on these farms for subsequent use in the manufacture of tires.

While drilling these wells, the usual weight of the tools averaged near 2,000 pounds with scow and jacks. Williams uses a wire line when he can get it, preferably MacWhyte Hi Lastic.

When asked about the ground formations peculiar to his section of the country, Williams grinned and said, "You name it, and we've got it. It certainly isn't any place for a beginner to start."

Under these conditions, the Phoenix Driller has averaged around 40 feet during a 10-hour day on the 20-inch holes; with scow and jacks he drilled 80 feet in seven hours.

The Arizonan has nothing but

(Continued on page 18)

• Here Williams is using his Bucyrus-Erie 24W to lower 16 tons of 10-inch heavy pipe on a job near Ajo, Arizona.

Ranchers Learn Why The Cows Come Home

by ARTHUR W. EMERSON

IT'S NOT without reason that many western ranchers have noticed their stock pass potholes abundantly filled with water to travel a greater distance to the barnyard where they could drink their fill of fresh water in clean and sanitary tanks.

Preference for well water by stock and fowls in many cases leads to greater water consumption which in turn results in added pounds and better health. That is why an increasing number of stock ranchers are turning to drilled wells which can assure them ready availability of water supplies at a low cost of installation.

Providing sufficient water for livestock in small pastures and on the range is much more than merely a question of developing enough ponds, wells, and springs to supply the needed amount of water. The protection of the grazing area, including a proper distribution of stock water in relation to the available forage is equally important. An area capable of supplying an abundance of forage cannot be fully utilized if the water is not accessible to livestock grazing on any part of that area. Distance of travel to water must be within reason, and topography such that livestock can get to the water easily without walking off meat.

In too many of these cases, springs, ponds, dugouts and shallow wells, even though available, do not furnish permanent water during wet periods and dry periods alike. The drilled well equipped with pump, power and storage appears to be the only answer in many areas.

Of course there are no set standards for stock wells in regard to size and depth. As in other wells, the type of hole put down is determined by the amount of water desired, geological formations, and the purse of the rancher. The driller can use his judgment in advising the ranchers on the well site, taking into view the aforementioned considerations.

Of perhaps equal importance, at least to the ranch owner, is the type of installation required for use of the water obtained by drilling. Water storage above ground is important if large numbers of livestock are to be watered from one well. If windmill power is to be used, preplanning is important to ascertain the amount of stored water which must be available for carry over during periods of low winds. Generally one full week's supply is a must. Wind velocity and frequency of calms are information which is available for most locations from the U. S. Weather Bureau and locally available in many instances from the Soil Conservation District.

In the West, a combination storage and drinking trough of galvanized iron or steel sides and concrete

Stock ranchers find that drilled wells producing fresh water and correct, efficient installation of water systems can pay off in better health and added pounds for their livestock.

• Water development consisting of drilled well, windmill, stock - water tank, and well-protected trampling area. Installation furnishes water for livestock grazing 3½ sections of land near Fryburg, N. D.

bottom has been used with success to provide considerable storage without undue expenditure.

In order to avoid crowding with possible resultant livestock injury, sufficient drinking space should be provided at troughs to water without undue delay. Troughs with a top width of 2 ft. or more can be used from both sides if properly located. Wide troughs should be provided with guardrails to prevent livestock from stepping or being crowded into the trough. Cattle troughs range from 1½ to 2 ft. in height. Ordinarily, sheep troughs should not be more than 1 ft. high. Regardless of what the trough material may be, substantial masonry foundations are preferable for most locations, for they provide support, anchorage and alignment.

Circular troughs provide the great-

• A 1500-gallon galvanized iron stock-water tank and a 100-foot trough constructed from an old 16-inch well casing split and welded together are combined to make a good example of a combination cattle and sheep watering system. Picture taken on Frank Long ranch, Buffalo, Wyo.

Soil Conservation Service Photos

Soil Conservation Service Photo.

• Well, 375 feet deep, supplies water for 80 ewes, 10 cows, 4 horses, and also for home consumption on Wyoming farm. Cost for operating gasoline-driven pump is approximately 10 cents a day.

est storage capacity per unit of construction materials used, and rectangular troughs give the greatest drinking space in proportion to their capacity. Circular concrete troughs are usually more difficult to construct than rectangular ones, owing to the forming that is required. Troughs should be placed in well-drained and easily accessible locations. They should be high enough to be safe from floodwater, yet low enough to be supplied by gravity flow.

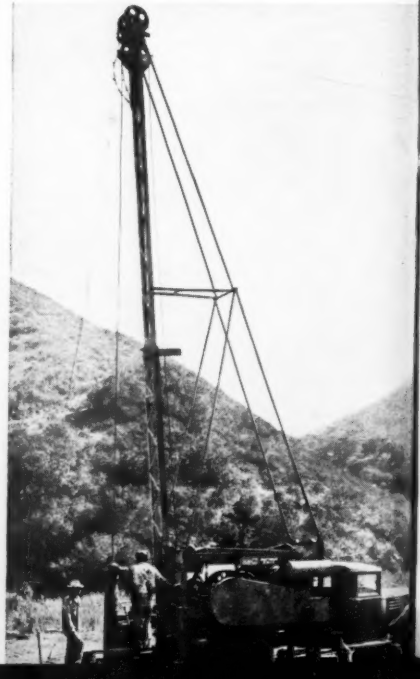
To prevent the formation of mudholes near the trough, from stamping and trampling, a layer of broken rocks, sand, and gravel should be worked into the soil around the trough or concrete apron. A concrete apron or platform around the trough makes a durable and lasting arrangement. All troughs should be fitted with adequate overflow pipes to carry waste water away. Troughs supplied by gravity from reservoirs or storage tanks can be supplied with float control. Where windmill and electric power is used, a float arrangement can be used on tank or trough for automatically starting and stopping the pumping unit. All troughs should be furnished with a drain unit and flush-out at the bottom.

All pipelines between water supply, storage and troughs must be protected from livestock. Guard-rails may be used; or preferably the pipelines may be placed under ground, particularly in the North, where protection from freezing must be provided for in most stockwater developments. It is advisable to place piplines below frost line. Those above the frost line will require some kind of insulation, and they should be fitted with necessary stop and waste valves to facilitate drainage and cleaning.

In the North, water trough and storage tanks also require protection from freezing during cold periods. During very cold periods it may be necessary to use special tank heaters not only to keep the water from freezing but to keep it from becoming too cold for satisfactory consumption for livestock. At other times, the water can be protected by

(Continued on page 18)

• C. J. Longwell, Santa Maria, is pictured putting down a typical stockwell near Los Almos, Calif., with his 22W.



Plain Hard Work Needed
To Beat Quicksand

The old adage that necessity is the mother of invention proved true in the case of E. J. Osterhout who successfully converted a two-inch boiler flue into a bailer.

BURIED in quicksand sounds like the opening of a fiction story but E. J. Osterhout & Sons can testify that their encounter with quicksand was anything but fancy—just plain honest-to-goodness hard work.

This incident stands out in the memory of Osterhout as the toughest problem he has encountered in his drilling experience during the 34 years he has worked around Selkirk, N. Y., his home town.

Osterhout was drilling a six-inch well for John Magee one mile south of Albany, N. Y. when he suddenly cut through the clay and hit quicksand at a depth of about 210 feet. The sand rushed up so rapidly that it immediately buried the bit 14 feet under.

Tries Boiler Flue

That left the New Yorker with quite a problem on his hands. After casting around awhile, he decided to make himself a bailer out of a two-inch boiler flue and try that. The idea worked out successfully and Osterhout dipped out sand until he reached the drill.

The next step unfolded rapidly. A ¾-inch pipe was run down the hole and water was forced through the pipe to wash the sand down to the bottom of the drill. After this operation was completed, the head of the drill was bumped and it came loose enough to be worked out of the hole.

The entire retrieving job took three men four days of hard work before they managed to work the drill out. After drilling was started again, water was reached at a 220-foot level and the resulting flow of 20 gpm was enough to supply 10 houses and 100 cows.

On another difficult job that the Easterner recalls with a mixture of feelings, he just about broke even. He was working on a 300-foot well of which 100 feet was rock. After "shooting it" with dynamite, he went down with tools to clean out and a stone fell in above the rope socket making it impossible to work the jars. Though the tools had to be abandoned, he had water so came out all right.

Drilled School Wells

The Osterhouts work a territory that covers the towns of Bethlehem, Ravena, and New Scotland and have drilled wells for five of the school districts in that area. They average around 1,600 feet a year in formations of clay, quicksand, hardpan, and rock.

The amount of Osterhout's work can be judged by the fact that he has a well every half-mile along the Hudson River from Albany to Athens, a distance of 25 miles. All the holes in this stretch were put down through slate gravel, the deepest being 130 feet.

The DRILLER

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Non-Standard Joint Users Are Advised

DRILLERS who have been reluctant to dispose of their old tools fitted with non-standard joints may in many cases find themselves in a pinch during the coming months.

The American Petroleum Institute adopted standard joint specifications for all drilling tools, both rotary and cable tools, used in oil well drilling. Manufacturers of tools for water well drilling have adopted these joint specifications so that tools now being manufactured have API joints. However, prior to this, each manufacturer built his tools according to his own specifications, and a good many of such tools are still in use.

Now that peacetime production is beginning to increase and the drain on steel supplies is increasing proportionately, manufacturers will be averse to build any tools with special joints—all of which may cause hardship to those drillers still operating with pre-API standard tools.

Unfortunately, there is no other alternative than to simply junk many tools, though, in some instances, the old tool joints can be worked over to conform with API standards.

Added Knowledge Profits Driller

THE article, "Ranchers Learn Why The Cows Come Home," appearing in this issue points to the fact that the good well driller is no longer just a person to set up his rig, drill a hole for water, and then pack up and leave.

Besides actually getting the water, the smart driller avails himself of the knowledge of the various installations connected with the uses of water and can then intelligently advise his client about specific problems and solutions encountered in setting up a water system. By this aid, he not only builds up a reputation in his community as the man to be consulted about water problems — which pays off in more jobs — but also has the added opportunity of handling more varied lines of water installations — which pays off in more profits.

Jefferson Promoted

ANNOUNCEMENT has been received from C. H. Morse, Ill., Vice President of Fairbanks, Morse & Co., telling of the assignment of Perry G. Jefferson as Traffic Manager of the Company, to replace Joseph W. Elliott, who recently retired from this position.

SELL DEMING Water Systems

For FULL USE of Running Water

KITCHEN

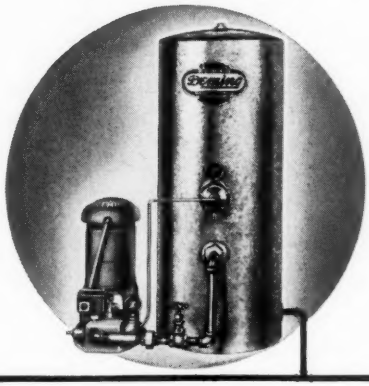
LAUNDRY

BATH ROOM

SHOWER

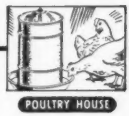
FIRE PROTECTION

LAWN



DAIRY BARN

FEED LOT


POULTRY HOUSE

HOG HOUSE

MILK COOLING

GARDEN

Build your water system business on a sound basis — Sell Deming — "The COMPLETE Line"!

When you "Sell Deming" you can sell every customer the right type and capacity of pump to permit *FULL Use* of running water. For instance:—

FOR SHALLOW WELLS

Marvelette	(Fig. 1975)	Capacity 250 G.P.H.
Marvel	(Fig. 2090)	Capacity 275 and 375 G.P.H.
Duplex	(Fig. 2895)	Capacity 500 to 1800 G.P.H.
Oil-Rite	(Fig. 1809)	Capacity 550 to 3000 G.P.H.

FOR DEEP WELLS

Oil-Rite	(Fig. 1062)	Capacity 190 to 1630 G.P.H.
Jet	(Fig. 4902)	Capacity 150 to 4200 G.P.H.

In addition, you have Deep Well Turbine Pumps, Centrifugal Pumps, Cellar Drainers, Hand Pumps, etc., all available from one source of supply.

THE DEMING CO. · SALEM, OHIO

NEWS OF THE MONTH

Lansing Is Host To Michigan Drillers This Month, 14-15

A LARGE gathering of well drillers is expected at Lansing on June 14 and 15 according to Convention Chairman Harold Armstrong when the Michigan Well Driller's Association will hold their annual convention at the Hotel Olds. The convention dates fall on Friday and Saturday.

Interest among the drillers has been high, and various manufacturers and dealers connected with the industry have indicated their intentions of displaying exhibits in the large ballroom which has been set aside for that purpose. For those who wish to set up well machines and other heavy equipment, a lot near the hotel has been secured to be placed at their disposal.

Officers To Be Elected

The opening day program will be highlighted by the business meeting scheduled for 2:00 p.m. at which the exhibitors will be introduced to the drillers. This in turn will be followed by the election of officers at 3:00 p.m. Some entertainment is being planned for the drillers and their guests Friday evening.

Sessions for Saturday morning will begin at 9:30 and adjourn in time for the luncheon. After the final afternoon business meetings, the annual banquet, complete with floorshow, will take place in the American Room of the Hotel Olds at 7:00 p.m.

All paid up members will receive a ticket to the banquet and their lady guests will be given free tickets to the luncheon Saturday noon.

Water Table Levels Low In New Mexico

UNLESS above normal precipitation occurs in southwestern New Mexico, water levels in that area will drop to an all-time record low according to the March bulletin of the U. S. Department of the Interior Geological Survey.

Though more water was pumped from the wells in that section in 1945 than in any other year, pumpage is still expected to increase moderately. There is no imminent danger of exhaustion of ground water supplies but well users may be faced with serious pumping and well deepening costs.

Heavy pumpage of underground reservoirs is also forecast for the Gila and Salt River Basins of Arizona where low surface water supplies have caused a heavy drain to be placed on the wells. In central and southern Arizona, many shallow demestic wells have failed as there has been little or no recharge to ground water reservoirs. However, groundwater conditions in Salt River Valley are not critical because it is a wide basin, but conditions will be critical by late summer in narrow basins along upper Gila and Santa Cruz Rivers unless there are heavy summer rains.

Other ground water statistics across the continent were mostly consistent with previous reports with above normal levels recorded in the eastern seaboard area with the exception of the Massachusetts area.

New Pump Booster

A NEW pump booster designed to make available heretofore inaccessible water supplies for fire fighting and to permit water drainage from pits or cellars beyond reach of standard pumping equipment has been announced by the Jet Pump Division, Derbyshire Machine & Tool Company, Philadelphia, Pa.

According to the company news release, the Accel-o-rate Pump Booster, using standard fire pumping equipment or its equivalent, will lift water vertically 100 feet or more, and will draft water for distances of 200 to 300 feet from water sources impossible to reach because of gulleys, ditches, mud or other obstacles. Employing the jet pump principle, the unit has no moving parts, weighs but 18 pounds, and will not become clogged.

Potential Market For Farm Water Systems Is Huge

THE total potential market for electric farm pump and water systems is between 6,500,000 and 7,000,000 units, according to C. D. Leiter, Chairman of the Planning Committee, National Association of Domestic and Farm Pumping Equipment and Allied Products Manufacturers, who addressed the farm sales meeting of the Edison Electric Institute at their recent conference in Chicago.

"Within a comparatively short period," Mr. Leiter said, "rural electrification will have saturated the upper two-thirds of the farms in United States, or substantially all but subsistence farms. That means more than 4,500,000 farms will have electricity. Since less than one-third of

FASTER DRILLING WITH . . .

For profitable shallow well drilling, "Hi-Lastic" keeps the bit turning better on all types of formation . . . helps reduce tendency for the hole to get out of round, and for the bit to channel. You can carry tools higher with "Hi-Lastic," and make a longer stroke, drill more holes faster. Internal lubrication gives "Hi-Lastic" longer life. No manilla cracker needed.

For deep wells, Macwhyte Standard Cable-Tool Line is specially designed and has the proper elasticity for deep well drilling.

For sand lines, Macwhyte coarse laid (6x7) or Macwhyte soft laid (6x19), Mild Plow Steel.

50th Year 1896 - 1946

Get the CORRECT line for your equipment from

MACWHYTE COMPANY

2939 Fourteenth Avenue, Kenosha, Wisconsin, or any authorized Macwhyte Distributor or Mill Depot

the present electrified farms have running water, there is an almost immediate potential for 3,500,000 farm water systems.

"There is an almost equal potential in the rural non-farm market. The 1940 census showed 2,722,000 rural non-farm homes without running water, and the number of rural homes is being greatly increased at the present time."

Increased Demand for Water

Leiter pointed out that a reasonable estimate of the total potential is, therefore, between 6,500,000 and 7,000,000. He called attention to the fact that the replacement market will add greatly to this potential. Many original installations are being replaced with units of larger capacity and which give better automatic service. While the desire for running water has been greatly accelerated, the facilities of the industry will be able to readily supply the increased demand.

Though strikers made much necessary equipment unavailable during the first part of 1946, Leiter estimated that with adequate materials that the industry would produce 500,000 water systems by the end of the year.

Government Plans To Build Multiple Houses For Vets

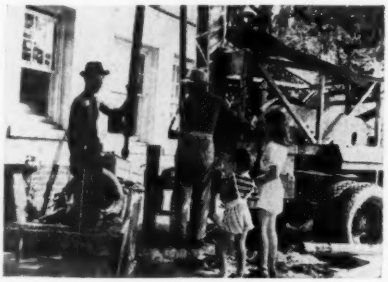
DRILLERS whose business is predominately concerned with the drilling of wells and installation of water systems in suburban areas may have been under the impression that the government's emergency housing program will consist almost exclusively of single-family houses.

According to the F. W. Dodge Corporation, fact-finders for the construction industry, this impression is widely spread. In order to correct this misapprehension, they queried W. W. Wyatt, U. S. Housing Expediter and Administrator of the National Housing Agency and received the following reply:

"One of the vital requirements of the veterans' emergency housing program is housing for rent because countless veterans will not want to buy or be in a position to do so. Therefore, multiple dwellings are a most important part of the program and we hope that the industry will do its utmost to produce them. I know that you understand that they must be produced under our program at a price veterans can afford or the whole objective of the program is lost. However, I want to assure you that priorities are issued for the sole purpose of producing homes for veterans and that multiple dwellings have a definite and highly important part in the program."

It is probable that the $80 per unit monthly rent ceiling will determine the top cost of investment projects to be built this year, though Wyatt wants as many apartments as possible to rent for $50 per month or less.

Starting Young



• Junior members of the sidewalk superintendent's club look on interestedly as H. D. May of Tampa, Florida, drills a suburban well in the Bay Shore area with his Bucyrus-Erie 21-W.

Electric Farm Water System Sales Zoom In 13 Years

THE sale of electric farm pumps and water systems has increased seven times, or from 50,000 units in 1932 to 392,000 units in 1945, during the 13 years that the Electric Water Systems Council has been in existence according to a news release from the Plumbing and Heating Industries Bureau.

This significant fact was emphasized at meetings in Chicago on April 16 and 17 of the Planning Committee of the Electric Water Systems Council and the Planning Committee of the National Association of Domestic and Farm Pumping Equipment and Allied Products Manufacturers.

Plans Continued

Plans for the continuation of the cooperative promotional activities of both groups to increase and intensify the nation-wide acceptance of farm pumps and water systems were outlined at the meetings. These plans center largely around the distribution and intensive use of the new "Manual of Water Supply Equipment." This 112-page book, illustrated with 200 line drawings, is the most complete discussion of all types of domestic and farm water systems that has ever been issued.

Participating manufacturers will place a copy of the manual in the hands of every dealer and distributor of water systems. Additional distribution will include county agents, teachers of agriculture in vocational schools, and land grant colleges.

A program for closer cooperation between manufacturers and the power companies was also recommended.

Pump Handle Pete Says:

Wimmin is funny Critters

Maw seen me takin' a glance at the new hired gal yestiddy. I shore was in trouble. Quick as a flash I changed the subject. Maw, we got lots of water now with that JENSEN unit, says I. Built solid as a rock—runs for a few cents a day an' handles any well 100 ft. or deeper. Maw was so gol durn mad she just walked away.

So if you need to change the subject sometime, just talk about making water cheap and dependable and abundant—with a JENSEN Pumping Unit. See your JENSEN dealer—or write us givin' his name and address. We'll send literature an' figgers—mighty interestin' figgers, too . . . . . .

JENSEN

BROTHERS MFG. CO.

14th and Pacific Streets

COFFEYVILLE, KANSAS, U. S. A.

EXPORT OFFICE, 50 Church St.

New York, City

FROM THE MAILBAG

This page is open to any of our readers having questions to ask relating to drilling, driving pipe, dressing bits, etc. All letters will be answered promptly by experienced drillers and engineers who are qualified to give intelligent advice on these subjects. We will publish as many letters of general interest as space will permit. Address: The Driller, South Milwaukee, Wis.

Dears Sirs:

I am interested in stream flow data. Just what is meant by it? Is it possible to locate underground streams or veins of water, and to make a correct estimate of their supply when being pumped?

R. E. F.

(Answer courtesy of the U. S. Geological Survey)

The term, stream-flow, refers to the discharge of *surface* streams. In connection with your question relating to ground water, the occurrence of ground water is dependent upon the character of rocks underlying the land surface in any given part of the country, and knowledge of the character and structure of these rocks is essential to locate ground water supplies. Such information is obtained by a study of geologic formations and the occurrence of the water in these formations.

Method Described

Geophysical instruments are sometimes used in geologic and hydrologic investigations to determine the location and structure of the water-bearing formations. Most geophysical methods have been developed largely in connection with the location of oil; however, the electrical resistivity method is widely used on hydrologic investigations (see THE DRILLER for Dec. 1944 to May, 1945. "Geophysical Logging of Water Wells in Northeastern Illinois). This method consists of passing an electric current through the earth from one electrode to another, and measuring the resistance of the various rock formations to the electric current. As this method depends largely on the conductivity of the ground water contained in the rock formations, it comes closer than other methods to giving direct hydrologic information. In general, coarse materials, such as sand and gravel, offer higher resistance than saturated fine-grained materials such as silt or clay, and materials saturated with fresh water offer more resistance than those containing salt water.

The resistivity determinations are most effectively used in prospecting for irregular water-bearing gravels in glacial drift, in determining the depth of fill in a valley, in locating faults that may affect the movement or occurrence of ground water, and in locating areas in which beds occur that contain water. It should be pointed out, however, that the information obtained from resistivity determinations supplements that obtained from test wells only in certain respects.

Use of Wells

Wells are needed to determine the shape of the water table, the areas of intake and discharge of ground water, the direction of movement of ground water, the permeability and specific yield of the water-bearing beds, the fluctuations of water levels in wells which indicate depletion or recharge and the chemical composition of the water. Furthermore, as two formations differing widely in their water-bearing capacities may have the same resistance to an electric current, it is usually necessary

to drill at least one test well in order to interpret the results of the resistivity determinations.

The use of geophysical instruments and the interpretation of the results require personnel with a high degree of technical training. The results obtained can be properly interpreted only by those who understand the methods and are especially acquainted with the geology of the area tested. It is advisable in groundwater investigations to obtain information on the water-bearing beds by studying the formations where they are exposed at the surface and studying the subsurface conditions by means of existing wells and test wells, before using geophysical exploration.

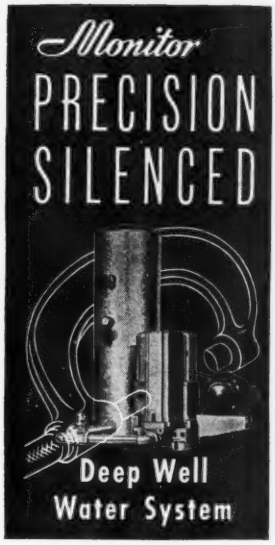
Instrument Tests Pump Performance

A new Pressuregraph brought out by Electro Products Laboratories, 349 W. Randolph St., Chicago 6, Ill., containing important improvements has been recently announced by the company in a news release.

According to the release, the instrument is provided with a Cathode Ray Oscillograph which indicates the performance of any engine, pump, or other device subject to pressure-time curve on the screen.

The instrument can be used for studies of all types of internal combustion engines, pumps, compressors, air and liquid pipe lines, etc. and shows instantly the erratic operation of a device which normally cannot be observed by other means, due to inertia of fly-wheels, and other factors.

The release also states that the Pressuregraph in addition to dynamic pressure variations can show static or slow pressure variations and cover pressures up to 10,000 p.s.i.



All moving parts of the Monitor automatic water system are precision-machined to near-perfection — reducing operating noises to a whisper. Like an automobile motor, it has a pressure lubrication system. Revolutionary "hollow-plunger" oil pump keeps down wear and contributes to long life and high operating efficiency.

A Monitor franchise in your territory will give you a profitable business for water systems and water system accessories.

Write your nearest Baker branch.

Monitor
SILENT FLOW

AUTOMATIC WATER SYSTEM

BAKER MFG. CO., EVANSVILLE, WISCONSIN

BAKER MFG. CO.: Minneapolis, Minn.; Madison, Wis.; Fort Dodge, Ia.; Cedar Rapids, Ia.; Omaha, Neb.; Kansas City, Mo.; Enid, Okla.; Hutchinson, Kansas; BAKER MFG. LTD.: Winnipeg, Canada; AXTELL CO.: Fort Worth, Texas; Amarillo, Texas; Lubbock, Texas; San Angelo, Texas.

Ranchers Learn . . .

(Continued from page 8)

covering the troughs, except for a small area at one end where the livestock drink, with a good layer of straw, or manure. A hinged cover for the open end, which can be closed when livestock are not drinking, will give more complete protection.

Special cold-weather type of concrete stock-watering troughs and tanks have been developed with sloping side walls with reinforcement in the bottom and sides for resistance to ice pressure resulting from freezing expansion. These tanks, when subjected to solid freezing of the water, disgorge the ice upward as it expands, with little if any damage to the trough walls and floor.

Development Costs Differ

Ranchers are finding, through experience and final results, that better utilization of the range, better distribution of the livestock on the range, better calf crops and better livestock marketing conditions are all directly traceable to and affected by livestock water and its location on the range and availability to feedyards.

Stockwater developments must be made within the economics of the set-up and many factors must be taken into consideration. Some operators may be able to spend only $5 per head for the development, whereby other set-ups may find it good business to spend two or three times that amount.

Broad Field Open

There is an opportunity for a closer tie-up between the well driller and the suppliers of water systems in order to eliminate instances of pumps and lifts not coordinated with power available and cases of haphazard piece by piece purchase by the rancher or farmer.

The Soil Conservation Service in its National Needs Survey in 1945 found that 1,202,000 stock water developments were needed at once which points to the big, broad, and profitable field for the water well driller in which to give complete service including a completed water unit from the well location to the water in the tank ready for the critter.

Water, Water . . .

(Continued from page 5)

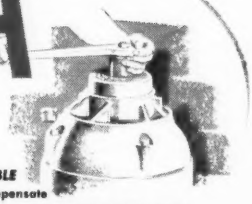
praise for his 24-W and like all excellent drillers keeps his equipment in tiptop shape at all times. Using this machine he drilled his deepest well when he went down 1,240 feet with a 10-inch hole. Williams dresses all of his own bits up to 10-inches.

Because of his wide-spread reputation, Williams has no trouble in getting business — his main problem is concerned with getting help to work his large backlog of orders. The future looks exceedingly bright for the Arizonan as water conditions are still favorable in his area. During his 26 years experience, Williams has noticed only a slight drop of the water table in the shallower wells.

Farm Loans To Vets

VETERANS have borrowed nearly $10,000,000 to buy farms and agricultural equipment under the Servicemen's Readjustment Act (G.I.), according to the latest Veterans Administration report. The total was $9,778,922, borrowed by 3,634 ex-servicemen for an average of $2,691 per loan. The government guaranteed $4,538,177, or $1,249 per loan.

POMONA



ADJUSTABLE
You can compensate your Pomona pump for wear—restore proper running clearance when at last it's necessary—by one simple "topside" adjustment. No need to pull the pump to eliminate recirculation; no high adjustment costs—and valuable pumping time is saved!

Where there's a well ...here's the way!

For pumping water from wells, pits, sumps, lakes, rivers, etc., here's the way to cut costs per gallon to the barest minimum—not only in the first year, but for many, many years to come! Pomona vertical turbine pumps have the combination you're after—high, maintained efficiency for continued low power cost, plus lowest yearly maintenance expense!

NO HIDDEN LEAKAGE!
Pomona, another product of Fairbanks-Morse, protects your pocketbook against power losses and wasted water with a readily accessible shaft seal, or "packing box." Quick visual inspection and easy maintenance are assured!

WHAT DO YOU NEED? The patented Pomona revolvable, water-lubricated rubber bearing with double (inside and out) bearing surfaces means quiet vibration-free shaft support under all conditions. Fairbanks-Morse vertical turbine pumps are built in sizes from 4" to 36"—with oil or water-lubrication—semi-open or enclosed impellers. Call your nearest Fairbanks-Morse office or your Pomona dealer for information on the pump best fitted to your job.

FAIRBANKS-MORSE

A name worth remembering

DIESEL LOCOMOTIVES · DIESEL ENGINES · MAGNETOS · GENERATORS · MOTORS · PUMPS
SCALES · STOKERS · RAILROAD MOTOR CARS and STANDPIPES · FARM EQUIPMENT

WIT BITS

Patient: "I seem to have a cold. I've already gone to see the druggist."

Doctor: "And what idiotic advice did he give you?"

Patient: "He told me to see you."

The battleship was in port and visitors were being shown around. The guide was exhibiting a bronze tablet set in the deck.

Guide: "Here is where our gallant captain fell."

Nervous Old Lady: "Well, no wonder, I nearly tripped over it myself."

Pal: "So your wife came to you on her knees last night?"

Driller: "Yes, and dared me to come out from under the bed."

A young girl was taking a swim in a secluded lake. Suddenly she spotted a boy tying knots in her clothes. Swimming to the bank she grabbed an old tub as a shield and advanced angrily on the youngster.

"Young man," she snapped, "do you know what I'm thinking?"

"Yup," said the boy, "you're thinking there's a bottom in that tub."

Editor: "Looks like another libel suit on our hands."

Lawyer: "What is it this time?"

Editor: "We printed in old Brown's obituary that he'd gone to a happier home, and Mrs. Brown is suing."

Doctor: "I prescribe absolute quiet for your husband. Here's a sleeping powder."

Wife: "When do I give it to him?"

Doctor: "You don't give it to him, you take it yourself."

A lady school teacher on vacation in a small, old-fashioned hotel, couldn't rest until she found the location of the fire exits. The first door she opened was that of the bath —occupied by a man taking a shower.

"Oh, excuse me! I'm looking for the fire escape." She ran.

She heard a shout behind her a moment later. A towel-clad man was gaining on her.

"Where's the fire?" he hollered in fright.

"Give a sentence with the words 'effervescent' and 'fiddlestick'."

"Effervescent enough covers on the bed, your fiddlestick out."

She kissed her bashful beau for bringing her flowers. He started to leave.

"I'm sorry I offended you," she said.

"I'm not offended," he replied, "I'm just going out for more flowers."

Sweet young thing (on golf course): "I notice that the players who get the lowest scores are not those who swear."

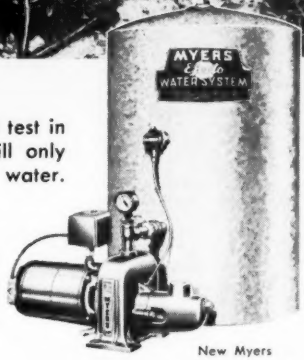
Fellow Golfer (as he dug another slice of turf): "What the hell have they got to swear about?"

"I'll give you five dollars," said the artist, "if you'll let me paint you."

The old mountaineer shifted his tobacco from one cheek to the other and back again. "It's easy money," he replied, "Hain't no question 'bout that. I'se just wondering how I'd get the paint off afterwards."

PLENTY of WATER for THIRSTY GARDENS!

Wells — and pumps — are given a real test in summer. A good well can win good will only when the pump installed delivers plenty of water. Recommend a reliable Myers that's big enough for the job — that will supply an abundance of water at all times, for all uses. There's a type and size for every requirement in the complete Myers line of pumps and water systems with capacities up to 4000 gallons per hour.



New Myers "H" Series Ejecto

TAKE OFF YOUR HAT TO MYERS WATER SYSTEMS and PUMPS

THE F. E. MYERS & BRO. CO.
Dept. F-8 • Ashland, Ohio

WATER SYSTEMS • POWER AND HAND PUMPS • CYLINDERS • ACCESSORIES

BARGAIN COUNTER

To the reader who wishes to advertise used equipment in "Bargain Counter" Section.

All advertising in this section is payable in advance. Enclose your check or money order with copy. Rate: 30c per line. Minimum charge $1.20. No discounts. Read these instructions carefully. The average line contains 28 characters (20 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number if blind advertisement is desired. Count your own copy to save delay. Holding up your advertisement one month to secure approval of revised copy or an additional remittance, may cost you real money in a lost sale. Be sure to enclose the correct amount of money with your order. Closing date — 10th of preceding month. Example — January issue closes December 10th.

To the reader wishing to answer Bargain Counter advertisements appearing on these pages: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of THE DRILLER, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

DRILLS FOR SALE

No. 14 re-built Armstrong, modern pipe pole derrick, with Bucyrus shock absorber top. Ford 3 forward speed and reverse motor unit, V-belted, all on pillar block roller bearings. Mounted on hard rubber, chain drive Packard, running condition ok. Boxes and racks for all tools. New belts. With tools, 3½" x 18' stem, jars, socket and 8" & 6" bits, bailer, wrenches with tightener, tongs, and small tools. Derrick floor and dog house, stove all complete with 600 ft. of new ⅝" drill line and good sand line. Ready to go, now working. Price — $2,500 cash.
P. O. Box 181—Delafield, Wis.

No. 35 Armstrong steel machine, Bucyrus shock absorber, on steel derrick. Re-built Le Roi motor, V-belted, quiet running. With 600' good ⅝" drill line and good sandline, wrenches, tongs, stem, jars, socket, bailer, derrick floor and dog house with stove ready to go. Price—$2,000 cash.
P. O. Box 181—Delafield, Wis.

Keystone 3½, wood frame, Bucyrus-Erie shock absorber. Trailer mounted, solid rear tires, could be mounted on L. W. B. truck. Model A engine just overhauled, 700 ft. ⅝" cable, 700 ft. new ¾" sand line. Motor raises derrick. No tools. Price $900. Evan Newman, Box 176, Toulon, Illinois —Phone 78.

Hollow rod drilling machine mounted on trailer complete with tools and 1½ Chevrolet truck. Also all steel rig, 500 foot capacity 6" holes. No tools. Mounted on 3 ton International truck.
Mahlon Bronson
Montrose, Michigan

MISC. FOR SALE

Complete set of cable tools for 3" holes, including pullers, jars and bailer. 1 set drilling jars 2-⅝"-7 joints. 1 combination socket, new with 3 sets of slips, 2-⅝"-7 pin. $100 for all. E. W. Kirkpatrick, 1530 W. Clark St., Springfield, O.

Stem, swivel socket, two sets jars, 2x3. Also 24" stroke Myers pump head, like new. Hall & Company, Box 388, Albany, N. Y.

WANTED

Howell #60 with or without tools. Give complete information. A. Fraisl & Son, 3507 Oak Park Ave., Berwyn, Ill.

Wanted: Bucyrus-Erie 21-W or 22-W well drill, with or without tools.
Box 126

All steel rig, 500 ft. capacity. To drill 6" holes. With or without truck or tools. Creating a job for a Veteran.
Box 127

Small, light water well drill capable of handling 250' to 300' work. C. M. Terrill, Cody, Nebraska.

HELP WANTED

Steady work guaranteed for experienced water well driller. Earn as high as $250 weekly if qualified. Must have car. Lower Michigan. Box 125

Two drillers wanted to operate modern machines on large drift holes and deep lime holes in and around Detroit. Vast experience unnecessary. $1.50 per hr. or contract on holes. Write, state age. Michigan Well Drilling Co., 8 E. Court, Pleasant Ridge, Michigan.

Driller wanted. Steady work, good wages. Modern equipment. Box 121

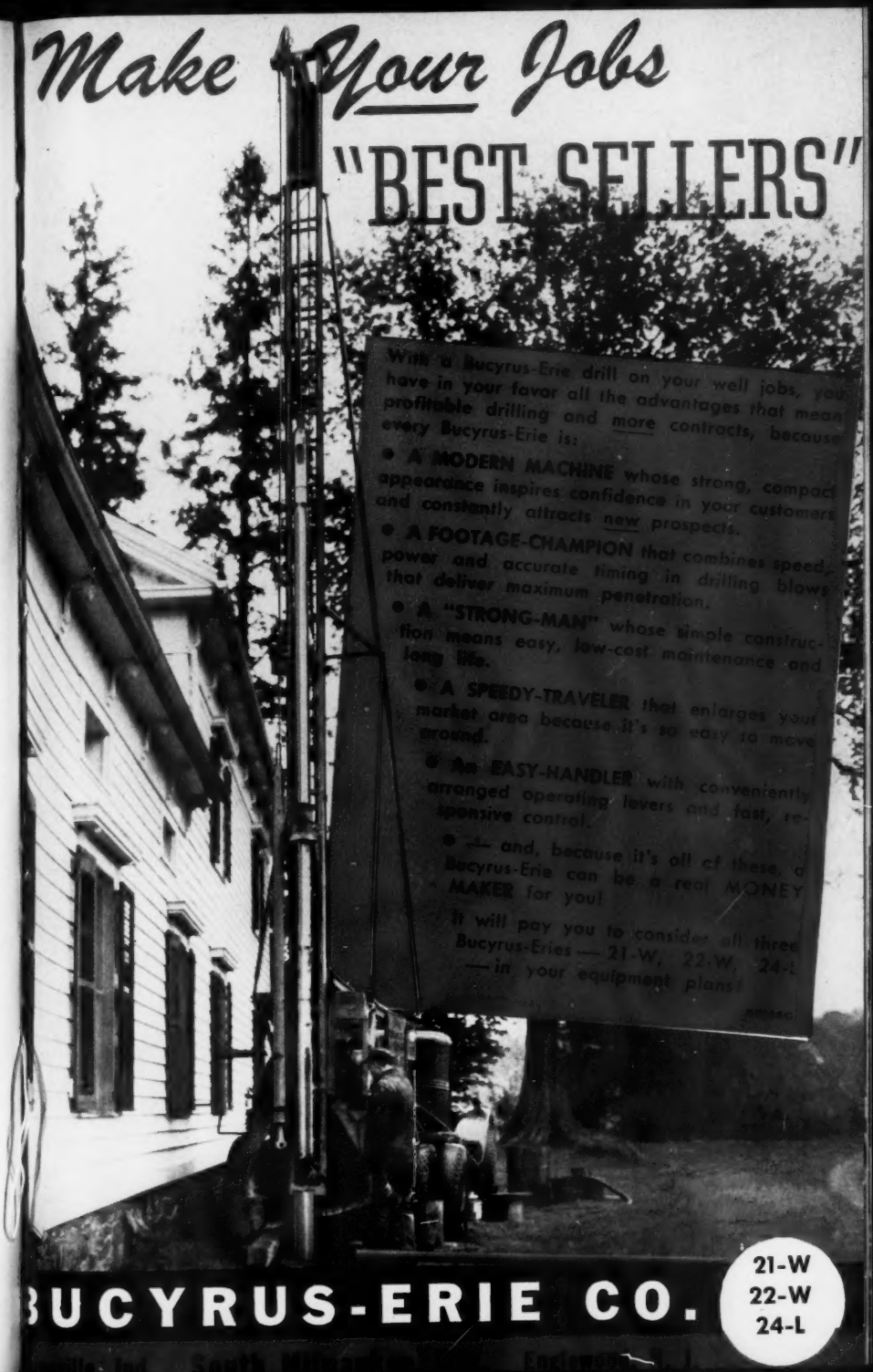
Experienced cable tool driller. One who can handle a drilling job to 12". Steady work, good wages. Box 123

Helper wanted, for drilling and pump work. G. I. training arrangements can be made.
Box 122

Work Wanted

Experienced driller (cable tool) would like permanent position. Will accept foreign country job if family can go. Can furnish good references.
Box 124

Bargain Counter Can Help You
In Buying and Selling Used Rigs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"BEST SELLERS"
With a Bucyrus-Erie drill on your well jobs, you have in your favor all the advantages that mean profitable drilling and more contracts, because every Bucyrus-Erie is:
• A MODERN MACHINE whose strong, compact appearance inspires confidence in your customers and constantly attracts new prospects.
• A FOOTAGE-CHAMPION that combines speed, power and accurate timing in drilling blows that deliver maximum penetration.
• A "STRONG-MAN" whose simple construction means easy, low-cost maintenance and long life.
• A SPEEDY-TRAVELER that enlarges your market area because it's so easy to move around.
• An EASY-HANDLER with conveniently arranged operating levers and fast, responsive control.
• —and, because it's all of these, a Bucyrus-Erie can be a real MONEY MAKER for you!
It will pay you to consider all three Bucyrus-Eries — 21-W, 22-W, 24-L — in your equipment plans!
BUCYRUS-ERIE CO.
21-W
22-W
24-L

June 1946

Water, Water, Water! — W. S. Williams Gets It 4
Veteran Arizona Driller uses mud scow method to produce remarkable flowing wells during 26 years of drilling experience in the Southwest.

Ranchers Learn Why the Cows Come Home 6
Stock ranchers find that drilled wells producing fresh water and correct, efficient installation of water systems can pay off in better health and added pounds for their livestock.

Plain Hard Work Needed to Beat Quicksand 9
The old adage that necessity is the mother of invention proved true in the case of E. J. Osterhout who successfully converted a two-inch boiler flue into a bailer.

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Non-standard joint users are advised; Added knowledge profits driller.

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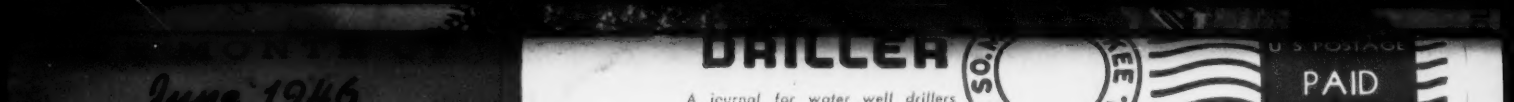
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